

In view of the foregoing amendments and following remarks, reconsideration of this application is respectfully requested.

Applicant appreciates the courtesies shown to Applicant's representative by Examiner Dinh in the February 4 and 6 telephone interviews. Applicant's separate record of the substance of the interviews is incorporated into the following remarks.

I. Rejection Under 35 U.S.C. §103(a)

Claims 1-15 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,800,763 (hereinafter Hoppe) taken together with U.S. Patent No. 5,856,378 (Ring). This rejection is respectfully traversed.

A. Background

By way of background, the presently claimed invention relates to an electrical circuit and transponder containing such electrical circuit in which an integrated circuit and an antenna are electrically connected. Because in the art of making transponders the mechanical connection between the integrated circuit and the antenna is initially comprised of only thin antenna wires (typically 20 microns to 60 microns thick), the connected integrated circuit and antenna are easily destroyed in typical further packaging processes such as lamination and molding. Thus, as discussed in the background section of the present application, making an intact electrical circuit with such design is very difficult.

The present invention addresses this problem by encapsulating at least the integrated circuit and the antenna (and preferably also the electrical connections between the integrated circuit and the antenna) in a polyamide thermoplastic resin having a melting point of from 120°C to 250°C and a processing pressure characteristic of from 5 to 40 bar such that the polyamide thermoplastic resin mechanically connects these components in a fixed relationship respective to each other. This renders the circuit easily handleable for further

processing and also protects the integrity of the electrical circuit in subsequent packaging processes.

Applicant respectfully submits that Hoppe and Ring, singly or in combination, do not teach or suggest the electrical circuit (claim 1) or transponder (claim 6) of the presently claimed invention.

The primary reference to Hoppe describes a method for producing data carriers, i.e., cards with electronic modules disposed therein. The method involves producing the data carrier by pressing a plastic granular material or powder around the elements to be incorporated into the data carrier. See column 1, line 65 to column 2, line 4. The invention is said to be an improvement over conventional injection molding techniques used to form data carriers. Hoppe differs from the presently claimed invention in several material respects detailed below. Applicant respectfully submits that in view of these differences, one of ordinary skill in the art would not have been led to the present invention from the teachings of Hoppe.

B. Hoppe Does not Teach or Suggest a Polyamide Thermoplastic Capsule

In the Office Action, it was again alleged that the molding compound 15 described in Hoppe to be used in making the card body corresponded to the capsule as recited in claims 1 and 6. Applicant respectfully disagrees.

As recited in each of claims 1 and 6, the present invention requires that the capsule encapsulate at least an integrated circuit and an antenna of the electrical circuit such that the integrated circuit and the antenna are mechanically connected to be held in a fixed position relative to each other. Such is not achieved in Hoppe with molding compound 15.

For example, as explained at column 4, lines 26-28 and again at column 5, lines 17-19, Hoppe takes steps to protect the integrated circuit component prior to subjecting the component to the pressing operation in which the card body is formed. In particular, Hoppe

indicates that the integrated circuit and bonding wires thereof are first sealed in a casting compound prior to being incorporated into the card body in the pressing operation.

As such, molding compound 15 that is formed into the card body is not a capsule as recited in claims 1 and 6 of the present application because it does not mechanically connect an integrated circuit and an antenna to fix these components relative to each other as required of the capsule in the present invention. Pre-pressing steps are taken in Hoppe to protect the element, and the molding compound is not used to protect or mechanically connect the components of the element.

This distinction over the teachings of Hoppe is even further evident with respect to new claims 29 and 30 that require contact between the polyamide thermoplastic encapsulating resin and the integrated circuit and antenna. Molding compound 15 in Hoppe would not have such contact, the bonding wires and integrated circuit having previously been sealed in a casting compound.

Still further, nowhere does Hoppe teach or suggest that either the molding compound 15 or the casting compound must be a polyamide thermoplastic resin, nor does Hoppe teach or suggest that such resin must have the processing properties recited in claims 1 and 6 for the polyamide thermoplastic resin.

Thus, neither the molding compound 15 nor the casting compound of Hoppe can be found to teach or suggest the invention recited in each of claims 1 and 6.

C. One Would not Have Been Led to the Invention by Hoppe

One of ordinary skill in the art would not have been led to modify the use made of the card body molding compound in Hoppe to have achieved the present invention. Hoppe teaches that the molding compound 15 is to be used in forming a card body. Hoppe does not teach or suggest that the molding compound is to have any protective function at all as with the capsule of the present invention. Still further, the capsule of the present invention

preferably encapsulates only the component (integrated circuit and antenna) itself to protect such component. The encapsulated component may then be handled and incorporated into a card as in Hoppe, for example by injection molding as explained at page 5, lines 1-11 and page 9, lines 24-29. As Hoppe describes only the formation of the card body itself and does not teach or suggest separate encapsulating protection means for the component as in the present invention, one of ordinary skill in the art would not have been led to the present invention from the teachings of Hoppe.

D. Ring Does not Remedy the Teachings of Hoppe

As discussed above, Hoppe does not teach or suggest that an encapsulating resin must be comprised of a polyamide thermoplastic resin having a melting point in the range of from 120°C to 250°C and a processing pressure characteristic of from 5 to 40 bar (i.e., a polyamide thermoplastic moldable at low temperature and low pressure). The Patent Office alleged that this nevertheless would have been obvious to one of ordinary skill in the art in view of Ring. Applicant respectfully disagrees.

Ring describes a powder coating composition, suitable for providing a coating having certain appearance or performance attributes, which includes composite particles that are agglomerates of individual particulate components fused or bonded together into composite particles such that the composite particles are air-fluidizable and can be applied to a substrate by electrostatic spray without causing the individual particles in the composite particles to break down under the mechanical and/or electrostatic forces associated with their application to a substrate. The Patent Office cited column 43, lines 20-24 and column 44, lines 61-65 as allegedly describing a polyamide thermoplastic having the processing properties recited in claims 1 and 6.

1. Ring Does not Describe a Moldable Resin

Applicant respectfully submits that one of ordinary skill in the art would not have turned to the teachings of Ring for any purpose in connection with the teachings of Hoppe. Ring describes a powder coating for electrostatic application to a substrate. Ring does not describe a molding composition at all. Accordingly, one of ordinary skill in the art would not have found the teachings of Ring relevant to the molding and casting compounds of Hoppe. One of ordinary skill in the art thus would not have combined the teachings of these references as alleged in the Office Action.

2. Ring Does not Describe a Thermoplastic Polyamide Coating

At columns 43 and 44 cited in the Office Action, Ring does not teach or suggest a coating that is either a thermoplastic or a polyamide.

First, the coatings described at columns 43 and 44 are both comprised of thermosetting resins, i.e., resins that are gelled or cured (also known as crosslinking). This can be confirmed by reference to column 43, lines 45-46, noting that the coating was sprayed and cured.

Second, the coating at column 43 is an acrylic and the coating at column 44 is a polyester. Thus, neither of these coatings is a polyamide, contrary to the assertions of the Patent Office.

Ring further does not appear to teach or suggest the use of polyamide coatings at any other point in the description therein.

Accordingly, Ring would not have led one of ordinary skill in the art to the use of a polyamide thermoplastic resin for any purpose, much less as an encapsulant as in the present invention.

3. Ring Also Does not Describe the Recited Processing Properties

The Patent Office also cited Ring as allegedly describing a resin having the processing properties (temperature and pressure) recited in claims 1 and 6. This is not accurate. While Ring mentions at column 43, lines 17-23 that the acrylic may be extruded at 125°C., no pressure is identified. After extrusion, it is mentioned that the formed chip may be reduced in size using air at a pressure of 9 bar. The pressure of the air used in reducing the size of the extruded chip is not a processing pressure property of the resin in Ring. Moreover, this pressure of the air is likely applied at room temperature.

Accordingly, Applicant strenuously disagrees with the characterization that Ring teaches a resin having the processing temperature and pressure properties recited in claims 1 and 6.

E. Dependent Claim 14

Regarding dependent claim 14, this claim recites that the capsule includes a material used as a mold during encapsulation with the thermoplastic resin. Hoppe and Ring fail to teach or suggest any feature even remotely relevant to this aspect of the claimed invention. Column 3, lines 30-31 of Hoppe cited by the Patent Office merely indicates that the molding compound 15 is used as the molding material in forming the card body. This portion of Hoppe does not teach or suggest, nor does any other portion of Hoppe teach or suggest, that mold 9 is ever to be incorporated into the final card body.

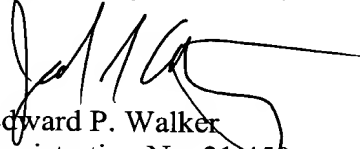
F. Conclusion

For all the foregoing reasons, Applicant respectfully submits that neither Hoppe nor Ring, taken singly or in combination, would have led one of ordinary skill in the art to the invention of claims 1-6, 8-15, 29 and 30. Reconsideration and withdrawal of this rejection are respectfully requested.

II. Conclusion

In view of the foregoing amendments and remarks, Applicant submits that claims 1-6, 8-15, 29 and 30 are in condition for allowance. Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,

  
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APPENDIX

Changes to Claims:

Claims 7 and 16-28 are canceled.

Claims 29 and 30 are added.

The following are marked-up versions of the amended claims 1 and 6:

1. (Three Times ~~Twice~~-Amended) An electrical circuit comprising an integrated circuit, an antenna and one or more electrical connections between the integrated circuit and the antenna, wherein at least the integrated circuit and the antenna are encapsulated within a capsule such that the capsule mechanically connects the integrated circuit and the antenna to hold the integrated circuit and the antenna in a fixed position relative to each other, and wherein the capsule comprises a polyamide thermoplastic resin having a melting point of from 120°C to 250°C and a processing pressure of from 5 to 40 bar.

6. (Three Times ~~Twice~~-Amended) Transponder comprising an electrical circuit containing at least one component suitable for interaction with an electromagnetic field encapsulated within a capsule, wherein the capsule comprises a polyamide thermoplastic resin having a melting point of from 120°C to 250°C and a processing pressure of from 5 to 40 bar, and wherein the electrical circuit is encapsulated by the polyamide thermoplastic resin such that at least an integrated circuit and an antenna of the electrical circuit are encapsulated by the polyamide thermoplastic resin and are mechanically connected by the polyamide thermoplastic resin to hold the integrated circuit and the antenna in a fixed position relative to each other.

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